

Only the *SHADOW* Knows! - The Science of Shadow Puppetry
Developed as part of Complementary Learning: Arts-integrated Math and Science Curricula
generously funded by the Martha Holden Jennings Foundation

Introduction

Through direct instruction, use of online learning resources, inquiry based labs and the creation of individual and team shadow puppets and plays, students will learn how light interacts with matter.

The first lesson will serve as an introduction to the properties of light and its role in creating shadows. While using puppets created by students and performing shadow plays, students will learn, first-hand, what differentiates opaque, translucent, and transparent materials. They will also learn how light travels and how an object's shadow is affected by the intensity and position of light in relation to both the object and the surface on which a shadow is cast.

Next students will determine which situation provided for in the lab stations will illustrate diffraction, reflection, and refraction. Finally, students will explore the interconnectedness of their own stories with those of ancient cultures in the study of shadow puppets.

Grade Level and Subject Area

This unit has been designed for students in grades 6-8 but can easily be adjusted for higher and lower age levels. The subject areas include physical science, visual arts, social studies and language arts curriculum.

Key Concepts:

Students will:

- * Begin with a pre-assessment K-W-L (What do I already know, what do I want to learn, and what did I learn). Group response recorded on overhead projector.
- * Observe then make predictions about the way light travels and determine whether the predictions are correct.
- * Direct instruction followed by the use of online and written resources to learn how shadows are formed.
- * Demonstrate an understanding of the terms translucent, opaque, and transparent properties by participating in an inquiry based lab.
- * Explore the way light interacts with matter by way of transmission, absorption, and reflection.
- * Students will then create shadow puppets and use them when applying these concepts.
- * Experiment with a light source, puppet, and screen to create different shadow effects, demonstrating an understanding that the properties of a shadow are determined by the intensity and position of the light source and the distances and angles between the light, object, and surface.

* In groups, create and perform shadow plays for peers and possibly younger student visitors.
(tentative)

Materials:

For Inquiry lab(s):

1. Light box and optical set (available from Arbor Scientific) or gather a set of prisms, mirrors and lenses. Light sources can be created from overhead projectors, slide projectors, clamp floodlights or large flashlights.
2. Gather feathers, string, forks, spoons, glass of water and a pan of water.
3. Set of tuning forks. Not necessary if you do not want to include a study of sound waves. (My students always wanted to learn more about sound waves, so I automatically include a lab station.)
4. Slinkies. The metal ones are the best but often get tangled.
5. Jump rope. Any size will do.
6. Energy ball toy. Available from Arbor Scientific but you can find many children's toys with the same circuits. Look for fuzzy chicks that chirp when you hold them or place in water. A completed circuit=noise or light.

Shadow Puppets:

1. Cardstock or bonded paper (should be thicker than regular copy paper).
2. Wire and wire cutters for attaching "rod" to shadow puppet.
3. Brads, pipe cleaners and various silk/plastic leaves and plants for backgrounds.
4. Scissors, tape, X-acto knives (caution) & glue.
5. Puppet designs. These may be original designs or download blackline images from any coloring page website.

Shadow Puppet Screen:

1. For table top screens, I use old picture frames and remove the glass. Many craft stores carry just the wooden frame for around \$2.00 30"X 24". Garage sales are a great source for these. Not only will you re-use and re-cycle, but you may help the planet by reducing the number of black velvet paintings still in existence. :0)
2. Screen material. May be purchase from craft store or simply buy a cheap sheet set. One queen size sheet can make 8 puppet screens.
3. Staple gun or thumb tacks for adhering the fabric to the screen. Remember to stretch the fabric by stapling one side of the back frame first, then stapling directly across from your initial staple. You'll form a "plus" sign pattern. Continue to rotate and staple as you go, trimming the excess fabric.
4. Many ways to stand your frame upright. My favorite so far is a 2' X 4" cut the length of your frame. Two "L" brackets and 4 small screws will anchor the screen in a 90*angle to the 2X4. We found that mounting the 2X4 behind the screen gives the students a place to wedge scenery.

Etc.:

1. Cleveland Museum of Art. For this unit, we utilized poster reproductions of a few popular pieces that demonstrated the use of shadows in the artwork (there are thousands to choose from!). We also studied online images of Chinese shadow puppets and mirrors found in the museum's collections.
2. CoolStuff from Arbor Scientific. This online resource is a treasure trove a fun and inviting activities that unite solid scientific concepts with labs and demonstrations that are both user friendly and fascinating.
3. Me and My Shadows. A teacher's handbook of simplified shadow puppet plays using the overhead projector. Adapted by Hope Joyce, JOY-CO Press. This is an out of print book that can still be found on many websites.
4. Touch This! Conceptual Physics for Everyone by Paul Hewitt. The #1 selling Physical Science book in the U.S. Paul breaks down the "big Ideas" into manageable bites.
5. NSTA Publications (website & book series) Stop Faking It! AWESOME series for those who are terrified of science or just need a fun refresher course.
6. What Do You See? An Optical Illusion Slide Show by Theoni Pappas. Wide World Publishing. Comes with slides (remember these?) and explanation. MANY websites offer similar optical illusions and can be downloaded easily. I prefer slides just so students know where their current technology evolved from.

Resources:

How does the eye work?

- www.eyerobics.com.au/eyesight.html
- NSTA.org Anatomy of the Eye.

Color - Transparent, Translucent, and Opaque Light

- Color - Transparent, Translucent, And Opaque - Light, Object, Materials, Passes, Glass, and Emerging <http://science.jrank.org/>
- Touch This! Conceptual Physics
by Paul G. Hewitt © Addison Wesley 1992
- NSTA Publications (website & book series) Stop Faking It!
- CoolStuff from Arbor Scientific. <http://www.arborsci.com/CoolStuff/cool9.htm>
- What Do You See? An Optical Illusion Slide Show by Theoni Pappas. Wide World Publishing.
- Gee, Wiz: How to Mix Art & Science; The Art of Thinking Scientifically. Linda Allison & David Katz. Little Brown & Co. 1983.

Shadow Puppetry (& Shadows)

- Me and My Shadows. A teacher's handbook of simplified shadow puppet plays using the overhead projector. Adapted by Hope Joyce, JOY-CO Press.
- Cleveland Museum of Art. clevelandart.org

- The Science of Shadow Puppets. <http://artsedge.kennedy-center.org>
- **U-Tube:** Shadow Puppets. Popular examples Owlry, Pillabulous Dance troupe.
- Legend of the Shadow Puppets: **Ancient China for Kids.** <http://china.mrdonn.org>
- The Bill Douglas Centre for the History of Cinema and Popular Culture. <http://www.exeter.ac.uk/bdc/shadows>
- **Shadow-Puppets.com** GREAT resource for the history of shadow puppets.

Procedure:

Day #1: Intro to “EYE” See! (1 class period of 40 minutes)

1. Students begin with a class discussion regarding light, optical illusions and shadows. (KWL chart; pre-assessment).
2. Students review the anatomy of the eye. Short film clip regarding vision (suggest Bill Nye or other clips available online or at SCI-Links). Formative assessment includes guided notes and exit cards.

Day #2: Intro to the Art of Shadow Puppets (1 class period of 40 minutes)

1. Students are presented with video clips, written resources and on-line photos of historical shadow puppets from around the world. Brief discussion of favorite children’s stories and fables will spark their interest in creating shadow puppets later in the unit.
2. Demo of light box and optical kit. Students are then presented with vocabulary from this unit and how it will apply to the upcoming lab.

Day #3 & #4: Begin Shadow Exploration & Design/Creation of Shadow Puppets (2-3 class periods of 40 minutes each. This time can be reduced considerably by using already drawn images available from online and print resources.)

1. Demonstrate basic shadow puppet creation. Encourage students to explore size, clarity & color of shadows when creating their characters.
2. I require a team storyboarding of their play. Note: the “plays” may last 1-2 minutes or longer depending upon your time frame. One group created a 2 minute spoof of animals climbing and walking a tight-rope, while another group of students created a time-machine shadow and re-created the scene where Martin Luther King Jr. was shot and killed. By utilizing the time machine they were able to change history. Other students created fables that included information about animals on the endangered species list.

Day #5 & #6: Let’s Make Some Waves! Lab. (1-2 class periods of 40 minutes each, depending on your supplies/rotation)

In this lab, students determine which situation illustrates diffraction, reflection, and refraction. Discuss the main definition of each term. Have students go to the different stations, perform the activity, and decide which motion the waves are producing.

The following will help in setting up stations. I typically set up 7 stations if I have limited supplies. If I’m able to borrow 7 sets of optical kits, students remain at their assigned tables. We completed #1-6 on the first day and the rest on the second day).

1. Fill a clear glass partially with water and put a pencil or other type of rod in it. Instruct students to look at the side. The students will see an off-centered pencil. The light is being refracted by the water, so our eyes see the pencil in two

different mediums. Answer: electromagnetic (light); refraction

2. Make 3 sets of slits with a razor in a sheet of aluminum foil. Instruct students to put each of the slits in front of the light and record what they see (these fit in the slits of the light box). The light will get elongated which illustrates that the light is actually diffracted or "flaring outward." Where the slits are double, the light will have bright and dark areas. This is called interference. (Do not expect students to know what actually causes this.) Answer: electromagnetic (light); diffraction
3. Instruct students to hit the tines of a tuning fork and place the tines on the surface of the water. Waves will move from the center of vibration. Notice that the pattern spreads from the center and causes little ripples. This shows not only diffraction but also interference similar to that in station 2. Answer: physical wave; diffraction
4. Using a spoon, instruct students to hit the surface of the water in a pan of water. The ripples should be large enough to hit the end of the pie tin and reflect backwards. However, students might only see the spreading outward and call this diffraction. Answer: physical wave, reflection and/or diffraction (students should justify answer)
5. Instruct two students extend the slinky in a straight line about 1 meter. One student should push back several of the coils and then release them. The waves will go down the slinky and reflect from the other end and bounce back. Answer: Physical wave, reflection.
6. Instruct two students to extend the rope. One should snap their wrist to create an oscillating wave. The wave reflects backwards when it hits the other student. Answer: physical wave, reflection
7. Instruct students to shine a small beam of light through a prism . If the light is angled correctly, they should get a rainbow effect. Also, put the prism on the laser light. (This shows the refraction better). Answer: electromagnetic (light); refraction
8. Instruct students to shine a light on a mirror (Students may also try a laser light). The light bounces off. Answer: electromagnetic (light); reflection
9. If a beam of light is shone through a lens, the light will refract through the lens and create a different size image on the other side. Answer: electromagnetic (light); refraction
10. The energy ball will make a sound and cause light to flash when you use your fingers to complete the circuit. Answer: both physical (sound) and electromagnetic (light); diffraction of light and sound.

Follow-up:

- An assessment rubric will be completed by student and teacher regarding the creation and completion of shadow puppets & play, as well as evaluating learning gains regarding the scientific concepts presented.
- If time allows I will include an optical illusion slide show as a form of assessment. If students can identify all of the concepts and terms presented in these illusions, then a very high level of mastery will have been achieved.
- Presentations of these shadow plays will be offered to their peers during a team gathering later in the school year. We have also extended an invitation to some of the Kindergarten classes in our district to come and see some of these final plays as well. (Not yet confirmed)

Assessment:

- Rubric
- Informal Assessment
- KWL chart
- Optical Illusion application assessment.

Standards:

- **Science Content:** Physical Science grade 5 (2002 standard grade 6-8) Light, Sound and Motion. Light and sound are forms of energy that behave in predictable ways. (Indicator #4 & 5 Ohio Standards) **Scientific Inquiry:** (Benchmark A and Indicator #1).
National Standards #9: Understand the source and properties of energy.
- **Visual Arts Content:** *Historical, Cultural & Social Context* grade 7, (benchmark A, indicator #1) Compare & contrast the distinctive characteristics of art forms from various cultural, historical and social contexts.
Creative Expression & Communication grade 7. (benchmarks A,B, & C)
- **Social Studies Content:**
Ancient Civilizations (check standards)

This lesson plan was developed by Kathy Manning PhD, Shaker Middle School.

BRINGING LIGHT Onto SHADOWS

Third-grade students investigate how and under what conditions shadows are formed.

By Lloyd H. Barrow

“What starts out long but gets shorter then longer each day?” Shadows! This student’s clever riddle was an opportunity to investigate how the Sun’s daily position in the sky influences shadow length. I created this mini-unit to help third-grade students understand that a shadow occurs when an opaque object blocks light (Shapiro 1994). The study of light and shadows teaches students about properties of light and materials.

Initial Investigations

Our shadow investigations began at the end of morning recess. Before going outside, I asked the third graders what a shadow is. Most responded that a shadow is made when something blocks light. I then asked how shadows might be longer or shorter. The students felt that a longer shadow was made when the object blocking the light was longer. They did not have a sense of the shadow’s length also being determined by the position of the light source relative to the object. I explained that we were going to study light and shadows after recess. I then asked the obvious, “What makes the light that hits the flagpole?” The students knew the Sun did. I then asked if the Sun *appeared* to stay in the same place during the day. (It is tempting to ask if the Sun moved during the day but that might reinforce the misconception that the Sun is moving, rather than the Earth.) No, they said, the Sun appears to move across the sky during the day. “Do shadows change?” I asked? No one was very sure. They had not



Figure 1.

Task card for matching individual shadow pattern.



noticed changes in shadows over the course of the day. We then reviewed how to measure length. How might we measure the length of the flagpole's shadow? Was a short ruler more appropriate or a meterstick? Most students responded that the meterstick would be easier and less work. We then practiced measuring across the room, with my observation that they were using good technique to carefully move the meterstick. Then we went out for recess.

Before returning to the classroom as recess ended, we gathered together and marked the length of the school flagpole's shadow with a stake, measured the length of the shadow, and recorded the length on the class chart. Following that, every hour the class went out to mark and measure the length of the shadow caused by the flagpole, recording the data and the time of each measurement in their science notebooks. By the end of the day, students observed that shadows got shorter and then longer over the course of the day. They wondered, "Does this pattern occur daily?" Through these measurements, students will gain some preliminary information about the position of the Sun in the sky and the direction and length of the shadows.

Shadow Surprises

The next day, students continued investigating shadows, this time working in pairs to determine whether their own shadow followed the same pattern as the flagpole during the day. Students went out at the beginning of the day, at lunch, and before dismissal.

Unfortunately, that investigation wasn't entirely successful because though students had fun studying shadows outdoors, they had trouble focusing upon the factors that cause shadows—e.g., the source of light, the surface where the shadow falls, and the object that blocks the light.

I decided to continue the shadow explorations in a darkened room indoors using a shadow pattern card (McDermott et al. 1996) (Figure 1), which enabled students to explore shadow behavior on a smaller scale using a manageably sized object, a golf tee. The cards and tees allow students to control the position of the

light source, in this case a small flashlight. With the card in hand, student teams shined the flashlight on the golf tee from different vertical positions to make the golf tee's shadow match the shadow pattern on the card. The students can see the tee and the shadow on the card. The room is darkened and the students point the flashlight at the tee until the shadow cast by the tee covers exactly the pattern on the card. Students then note where the flashlight was positioned. In this way, students were able

to make golf tee shadows that were very long, very short, and same length at the golf tee (Figure 2).

Then, in their science notebooks, students recorded how they made each pattern and answered the questions, "*To make a long shadow, where was the flashlight?* (near the table, closer to the base of the tee) *To make a very short shadow where must the flashlight be?* (near the top of the tee). *Could you position the flashlight so there was no shadow?* (yes; some students may not answer) *Where was the flashlight?*" (directly above the tee; students might also say, from below the tee). The next day the class revisited the flagpole and its shadow. Our focus question was, "What is the Sun's position and the shadow position in relation to the flagpole?," and students recorded the data in their notebooks. In order to report the position of the Sun relative to the pole, students needed a reference point. We made the horizon the reference point and students noted about how far above the horizon the Sun appeared. Remind students to never look directly at the Sun. They repeated the data collection at noon and once more later before dismissal (3:30 p.m.).

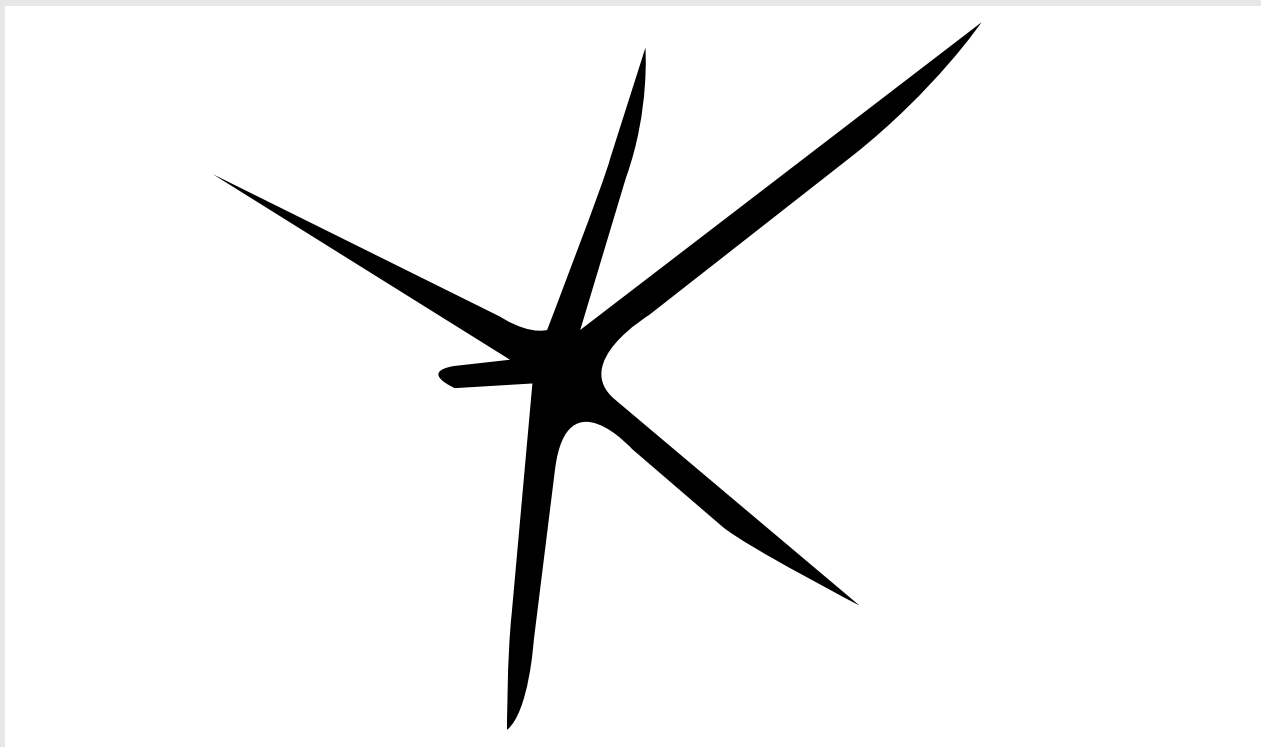


Students observed that the shadow was the shortest at noon. They also noted the Sun was highest above the horizon at this point. After they had collected the data for the final time that day, students wrote explanations in their science notebooks as to how the Sun's position influenced the position of an object's shadow. The students noted that the shadows were longest in the morning and afternoon and shortest at lunch. They noted that the Sun was closer to the horizon in the morning and afternoon. Many compared this observation to the cards they used earlier. They noted that the Sun, like the flashlight, was lower on the horizon when casting the longer shadows. When the Sun was "above" the pole, the shadow was shortest.

For homework, students were assigned to draw a shadow they observed at home, noting the light source and the object that caused the shadow. This gave the students more practice with the concept and the opportunity to apply what they had learned. The following day, students shared their shadows with the classmates.

Figure 2.

Task card for matching multiple shadow patterns.



Assessments and Wrap-Up

To conclude our shadow experiences, students were given various scenarios on the shadow cards and asked to predict where the light was positioned to make that shadow. Then the students were shown pictures of light sources and a pole and asked to predict what the shadow would look like. Students were able to accurately predict the answers. As a summative assessment, students were given a written assessment in which students made the same predictions based on pictures of shadows and light.

Our shadow study helped students develop their personal ideas about sunlight and shadows. Because this activity can be done several times throughout the school year, children can see firsthand how length of shadows change over the course of a year and how the position of the Sun influences location of the shadow, building a solid foundation for more in-depth learning about seasons in later years. ■

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Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Content Standards

Grades K–4

Standard D: Earth and Space Science

- Changes in Earth and sky
- Understandings about scientific inquiry

Standard F: Physical Science

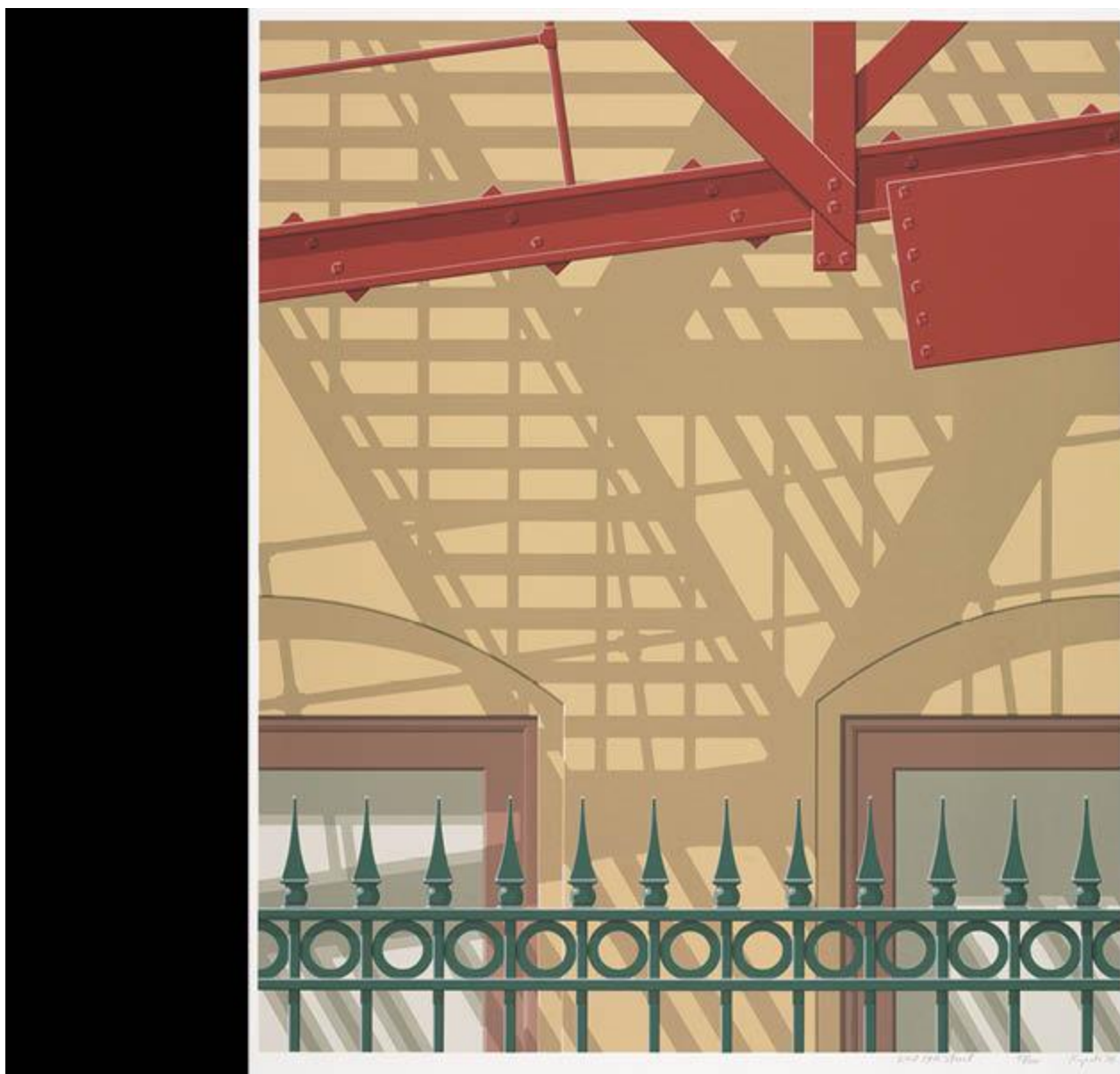
- Properties of objects and materials
- Position and motion of objects

References

- Bishop, M. and L. Barrow. 1998. Standards out of the shadows—Facilitating learning in K–12 science. *Science Activities* 35(1): 30–35.
- McDermott, L.C., and the Physics Education Group of the University of Washington. 1996. *Physics by inquiry, volume II*. New York: John Wiley and Sons.
- National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press.
- Shapiro, B. 1994. *What children bring to light*. New York: Teachers College Press.



Collection Reflection, 1997. Phyllis Sloane (American, b. 1921). Watercolor; 97.5 x 119.9 cm.
Gift of the Artist 2008.68



West 74th Street, 1974. Hugh M. Kepets (American, b. 1946). Screenprint; 91.4 x 76.2 cm. The Harold T. Clark Educational Extension Fund 1977.1001



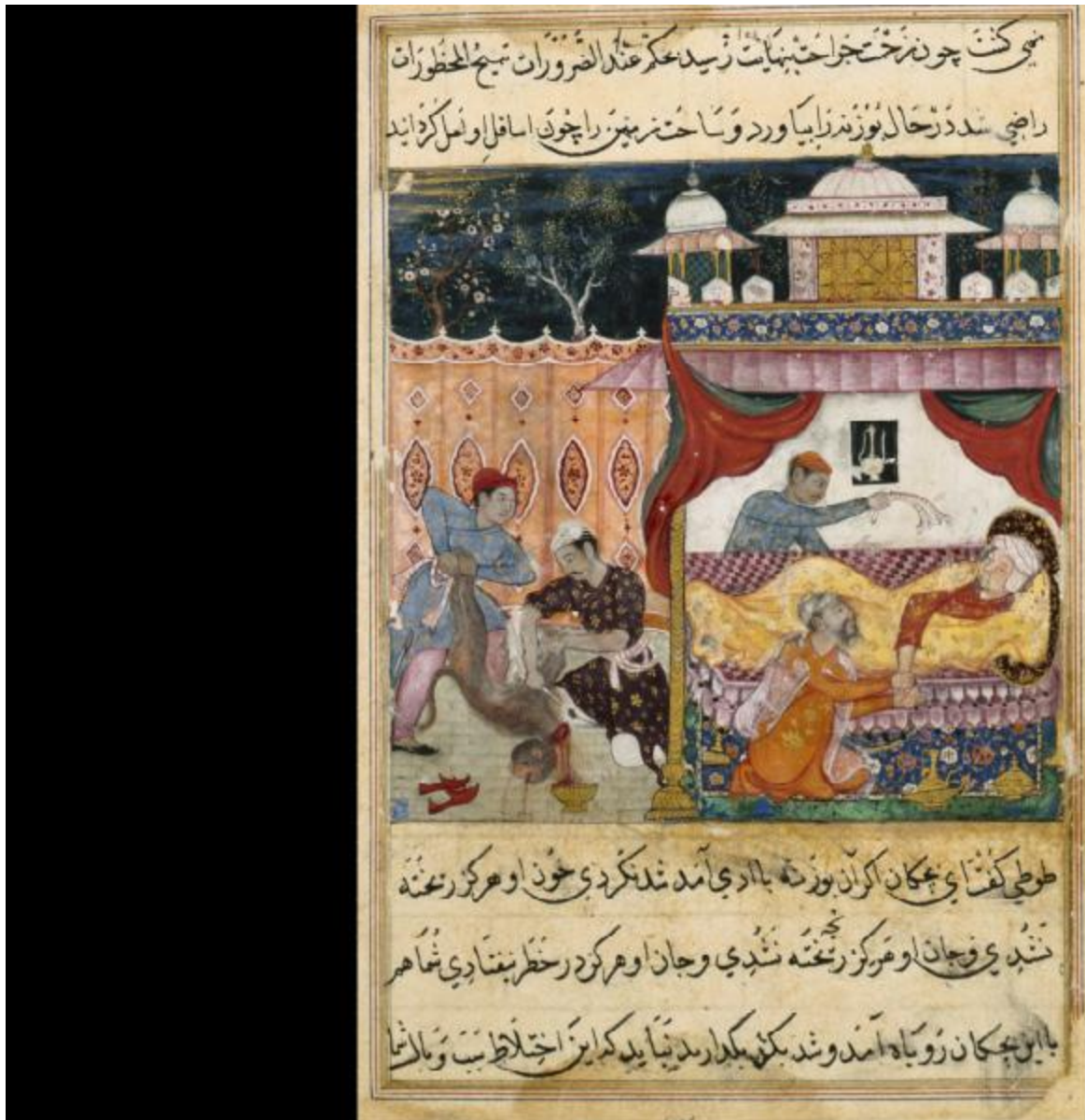
[West 5th Street alley, Tremont](#), 2002. Andrew Borowiec (American, 1956). Gelatin silver print; 32.3 x 47.8 cm. Gift of Mark Schwartz and Bettina Katz in honor of James and Hanna Bartlett 2009.158.35 © Andrew Borowiec 2008



Sitting Bear, 1908. Edward S. Curtis (American, 1868–1952). Photogravure. Presented by Mrs. James H. Hoyt, Elton Hoyt, II, and Mrs. Amasa Stone Mather in memory of James H. Hoyt 1995.203.25.6



Avenue de Clichy, 1887. Louis Anquetin (French, 1861–1932). Oil on canvas; 69 x 53 cm.
Wadsworth Atheneum Museum of Art, Hartford, The Ella Gallup Sumner and Mary Catlin Sumner Collection Fund 1966.7. © Wadsworth Atheneum Museum of Art, Hartford, CT. The Ella Gallup Sumner and Mary Catlin Sumner Collection Fund



[*"Tuti Nama" \(Tales of a Parrot\)*](#), c. 1560. India, Mughal, early Akbari period. Ink, color, and gold on paper. Gift of Mrs. A. Dean Perry 1962.279.33

Friedlander

March 1–May 31, 2009 Kelvin and Eleanor Smith Exhibition Hall

Lee Friedlander's witty and unblinking view of everyday American life was showcased in this expansive exhibition that gathered more than 350 photographs plus trade and special edition books to trace a five-decade career. Born in 1934, he gained fame in the early 1960s with off-balance street photographs that evoke the complexity of modern life.

Always working in series, Friedlander mines what he calls —the American social landscape,” beginning with a layered view of city streets—shop fronts, ads, televisions, and cars. This central theme was supplemented by subjects including portraits, self-portraits, landscapes, still lifes, nudes, and studies of people at work. This body of work stands as one of the major achievements in 20th-century art, combining astute observation and graphic verve to present a compelling vision of contemporary America.

This exhibition was organized by the Museum of Modern Art, New York. Made possible by Fred and Laura Ruth Bidwell, Agnes Gund, Toby Devan Lewis, and Mark Schwartz and Bettina Katz. The Cleveland Museum of Art is generously funded by Cuyahoga County residents through Cuyahoga Arts and Culture. The Ohio Arts Council helped fund this exhibition with state tax dollars to encourage economic growth, educational excellence, and cultural enrichment for all Ohioans.



Galax, Virginia, 1962. Lee Friedlander (American, born 1934). Gelatin silver print; 14.9 x 22.5 cm. The Museum of Modern Art, New York, Gift of Celeste Bartos. © 2009 Lee Friedlander



New York City, 1966. Lee Friedlander (American, born 1934). Gelatin silver print; 14.6 x 22 cm. The Museum of Modern Art, New York, Carl Jacobs Fund. © 2009 Lee Friedlander

7 entries found. All are shown.





IML # 322608
category: DECORATIVE ARTS/OTHER
media: THEATRE
title: Opera Costumes and Rod and Glove Puppets
style period school: Ch'ing
site: Singapore
country: CHINA
owner: Nat. Mus.



IML # 322463
category: DECORATIVE ARTS/OTHER
media: THEATRE
title: Puppets, Wayan Kulit
style period school: Java Wayang
site: Jakkarta
material: PAINTED BUFFALO HIDE
country: INDONESIA
owner: Nat. Mus.



IML # 262904
category: DECORATIVE ARTS
media: PHOTO.
artist: Beadle, Ernst
title: PORTRAIT, JOHN BERNARD MYERS.
title_alt: WITH KURT SELIGMANN PUPPET FOR QUARRELING PAIR BY JANE BOWLES.
site: New York, NY
subject: Myers, John Bernard --Seligmann, Kurt --Bowles, Jane Auer PHOTO.
material: B & W PHOTO
country: UNITED STATES OF AMERICA



IML # 559135
CMA Acc # 1949.435
media: PRINT
artist: Kazuma Oda [artist]
title: Puppets Hanging in the Greenroom of the Bunraku Theater, Osaka
material: LITHOGRAPH



IML # 433059
category: MIXED MEDIA
media: MIXED MEDIA
artist: Kienholz, Edward
title: ROXYS,
title detail: det, The Madam.
subject: Gender Issues - Feminism
material: PAINT --RESIN --MANNEQUIN --FURNITURE
country: UNITED STATES OF AMERICA
owner: Coll. Reinhard Onnasch



IML # 456049
category: PAINTING
media: PAINTING
artist: Larsson, Carl
title: PORTRAIT, CARL LARSSON.
subject: Portrait - Artist --Self-portrait --Toys - Puppets
material: OIL ON CANVAS
country: SWEDEN
owner: Florence, Uffizi
size: 95.5 x 61.5 cm



IML # 446345
additional # 1999-1404/1
category: DECORATIVE ARTS
media: CERAMICS
artist: Schreckengost, Viktor
title: PUPPET HEAD, JOSEPH.
style period school: 20th c.
subject: Toys - Puppets CERAMICS
country: UNITED STATES OF AMERICA
owner: Artist's Coll.
exhibition: CMA, V. Schreckengost & 20th c. Design, 2000





1932.250



Chinese

Accession Number:	1932.250
Primary Title:	Shadow Figure- Woman
Date:	
Artist(s):	China
Credit Line:	Gift of Mrs. Charles Eisenman
Department:	Education Art
Collection:	Ed Art - Chinese Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:29.85 cm (h:11 3/4 inches)
Label Copy:	Shadow figures like this one are made of transparent leather, usually donkey skin, that maximizes the effect of light in the play. The bodies are jointed and three wooden sticks give mobility to the figures. Each figure has a very elaborate headdress and costume, similar to traditional actors and actresses in a modern Chinese play.
Object ID:	63608
Object Type:	X
Period:	

1947.243



Chinese

Accession Number:	1947.243
Primary Title:	Shadow Figure- Man
Date:	c 1900- 1925
Artist(s):	China, Early 20th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Chinese Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment, wood
Copyright:	
Dimensions:	Overall - h:29.21 cm (h:11 1/2 inches)
Label Copy:	Shadow figures like this one are made of transparent leather, usually donkey skin, that maximizes the effect of light in the play. The bodies are jointed and three wooden sticks give mobility to the figures. Each figure has a very elaborate headdress and costume, similar to traditional actors and actresses in a modern Chinese play.
Object ID:	63607
Object Type:	X
Period:	Early 20th century
Inscription	

Chinese

Accession Number:	1947.249
Primary Title:	Shadow Puppet (Wajang)
Date:	c 1900- 1925
Artist(s):	China, Early 20th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	
Copyright:	
Dimensions:	Framed - h:71.12 w:82.23 cm (h:28 w:32 5/16 inches)
Label Copy:	
Object ID:	69471
Object Type:	X
Period:	Early 20th century
Inscription	
Inscription	

Chinese

Accession Number:	1947.240
Primary Title:	Shadow Figure- Man
Date:	c 1800- 1850
Artist(s):	China, Early 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Chinese Art
Artists search link:	
Classification:	Miscellaneous
Medium:	leather, pigment, wood
Copyright:	
Dimensions:	Overall - h:44.45 cm (h:17 1/2 inches)
Label Copy:	
Object ID:	65980
Object Type:	X
Period:	Early 19th century
Inscription	
Inscription	

Chinese

Accession Number:	1917.742
Primary Title:	Shadow Puppet- Crowned Figure
Date:	c 1900- 1917
Artist(s):	China, Early 20th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Chinese Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment, wood handle
Copyright:	
Dimensions:	Overall - h:35.56 w:13.97 cm (h:14 w:5 1/2 inches)
Label Copy:	
Object ID:	64303
Object Type:	X
Period:	Early 20th century
Inscription	
Inscription	

Indonesian Shadow Puppets



Javanese

Accession Number:	1928.734.b
Primary Title:	Shadow Puppet (Wajang)- Woman(head)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:54.61 cm (h:21 1/2 inches)
Label Copy:	
Object ID:	84656
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.736.a
Primary Title:	Shadow Puppet (Wajang)- Woman(body)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:58.42 cm (h:23 inches)
Label Copy:	
Object ID:	69054
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.740.a
Primary Title:	Shadow Puppet (Wajang)- Woman(body)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:60.96 cm (h:24 inches)
Label Copy:	
Object ID:	69055
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.740.b
Primary Title:	Shadow Puppet (Wajang)- Woman(head)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:60.96 cm (h:24 inches)
Label Copy:	
Object ID:	84658
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.741.a
Primary Title:	Shadow Puppet (Wajang)- Woman(body)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:54.61 cm (h:21 1/2 inches)
Label Copy:	
Object ID:	69056
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.741.b
Primary Title:	Shadow Puppet (Wajang)- Woman(head)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:54.61 cm (h:21 1/2 inches)
Label Copy:	
Object ID:	84654
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.745.a
Primary Title:	Shadow Puppet (Wajang)- Woman(body)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:50.80 cm (h:20 inches)
Label Copy:	
Object ID:	69069
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.745.b
Primary Title:	Shadow Puppet (Wajang)- Woman(head)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:50.80 cm (h:20 inches)
Label Copy:	
Object ID:	84655
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1929.23.a
Primary Title:	Shadow Puppet (Wajang)- Woman(body)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. O. E. Kelsey
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:63.50 cm (h:25 inches)
Label Copy:	
Object ID:	69070
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1929.23.b
Primary Title:	Shadow Puppet (Wajang)- Woman(head)
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. O. E. Kelsey
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:63.50 cm (h:25 inches)
Label Copy:	
Object ID:	84653
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1969.562.a
Primary Title:	Shadow Puppet, Wayang Golek(body)
Date:	1900's
Artist(s):	Java (Indonesia), Bandung, 20th century
Credit Line:	Gift of Mildred Irene Szojak
Department:	Education Art
Collection:	Ed Art - Dolls and Toys
Artists search link:	
Classification:	Miscellaneous
Medium:	Ivory, cotton, leather, velvet, beads, sequins
Copyright:	
Dimensions:	Overall - h:73.67 cm (h:29 inches) Head - h:22.86 cm (h:9 inches) Body - h:60.96 cm (h:24 inches) Dress - h:48.26 cm (h:19 inches)
Label Copy:	
Object ID:	77101
Object Type:	X

Javanese

Accession Number:	1969.562.b
Primary Title:	Shadow Puppet, Wayang Golek(head)
Date:	1900's
Artist(s):	Java (Indonesia), Bandung, 20th century
Credit Line:	Gift of Mildred Irene Szojak
Department:	Education Art
Collection:	Ed Art - Dolls and Toys
Artists search link:	
Classification:	Miscellaneous
Medium:	Ivory, cotton, leather, velvet, beads, sequins
Copyright:	
Dimensions:	Overall - h:73.67 cm (h:29 inches) Head - h:22.86 cm (h:9 inches) Body - h:60.96 cm (h:24 inches) Dress - h:48.26 cm (h:19 inches)
Label Copy:	
Object ID:	84659
Object Type:	X

Javanese

Accession Number:	1969.563.a
Primary Title:	Shadow Puppet, Wayang Golek(body)
Date:	1900's
Artist(s):	Java (Indonesia), Bandung, 20th century
Credit Line:	Gift of Mildred Irene Szojak
Department:	Education Art
Collection:	Ed Art - Dolls and Toys
Artists search link:	
Classification:	Miscellaneous
Medium:	Ivory, cotton, velvet, beads, sequins
Copyright:	
Dimensions:	Overall - h:66.04 cm (h:26 inches) Head - h:14.92 cm (h:5 13/16 inches) Body - h:48.26 cm (h:19 inches) Dress - h:46.99 cm (h:18 1/2 inches)
Label Copy:	
Object ID:	77103
Object Type:	X

Javanese

Accession Number:	1969.563.b
Primary Title:	Shadow Puppet, Wayang Golek(head)
Date:	1900's
Artist(s):	Java (Indonesia), Bandung, 20th century
Credit Line:	Gift of Mildred Irene Szojak
Department:	Education Art
Collection:	Ed Art - Dolls and Toys
Artists search link:	
Classification:	Miscellaneous
Medium:	Ivory, cotton, velvet, beads, sequins
Copyright:	
Dimensions:	Overall - h:66.04 cm (h:26 inches) Head - h:14.92 cm (h:5 13/16 inches) Body - h:48.26 cm (h:19 inches) Dress - h:46.99 cm (h:18 1/2 inches)
Label Copy:	
Object ID:	84657
Object Type:	X

Balinese

Accession Number:	1955.25
Primary Title:	Shadow Puppet (Wajang)
Date:	c 1900s ?
Artist(s):	Indonesia, Bali, 20th century (?)
Credit Line:	Gift of Mrs. Elizabeth Honecker
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, horn
Copyright:	
Dimensions:	Framed - h:83.19 w:56.20 cm (h:32 3/4 w:22 1/8 inches)
Label Copy:	
Object ID:	69486
Object Type:	X
Period:	20th century (?)
Inscription	
Inscription	

Javanese

Accession Number:	1923.699
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:72.39 cm (h:28 1/2 inches)
Label Copy:	
Object ID:	69043
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1923.700
Primary Title:	Shadow Puppet (Wajang)- Man
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:68.58 cm (h:27 inches)
Label Copy:	
Object ID:	69044
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1923.701
Primary Title:	Shadow Puppet (Wajang)- Demon
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:67.31 cm (h:26 1/2 inches)
Label Copy:	
Object ID:	69045
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.395
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:40.64 cm (h:16 inches)
Label Copy:	
Object ID:	69046
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.396
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:40.64 cm (h:16 inches)
Label Copy:	
Object ID:	69047
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.397
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:46.36 cm (h:18 1/4 inches)
Label Copy:	
Object ID:	69048
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.398
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:59.69 cm (h:23 1/2 inches)
Label Copy:	
Object ID:	69049
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.400
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:63.50 cm (h:25 inches)
Label Copy:	
Object ID:	69050
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.401
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:46.99 cm (h:18 1/2 inches)
Label Copy:	
Object ID:	69051
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.402
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:52.71 cm (h:20 3/4 inches)
Label Copy:	
Object ID:	69052
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1928.734
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:54.61 cm (h:21 1/2 inches)
Label Copy:	
Object ID:	69053
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1928.736
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:58.42 cm (h:23 inches)
Label Copy:	
Object ID:	69054
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1928.740
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:60.96 cm (h:24 inches)
Label Copy:	
Object ID:	69055
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1928.741
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:54.61 cm (h:21 1/2 inches)
Label Copy:	
Object ID:	69056
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1928.745
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:50.80 cm (h:20 inches)
Label Copy:	
Object ID:	69069
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1929.23
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. O. E. Kelsey
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Wood
Medium:	wood, pigment
Copyright:	
Dimensions:	Overall - h:63.50 cm (h:25 inches)
Label Copy:	
Object ID:	69070
Object Type:	X
Period:	19th century
Receipt History:	

Javanese

Accession Number:	1929.458
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Charles F. Ramus
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:72.39 cm (h:28 1/2 inches)
Label Copy:	
Object ID:	69116
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1930.54
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Educational Purchase Fund
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:43.82 cm (h:17 1/4 inches)
Label Copy:	
Object ID:	69121
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1932.454
Primary Title:	Shadow Puppet (Wajang)- Demon
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. Charles Eisenman
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:82.55 cm (h:32 1/2 inches)
Label Copy:	
Object ID:	69128
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1950.130
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Henry Hunt Clark
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:63.50 cm (h:25 inches)
Label Copy:	
Object ID:	69140
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1955.22
Primary Title:	Shadow Puppet (Wajang)- Woman
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. Elizabeth Honecker
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:56.52 cm (h:22 1/4 inches)
Label Copy:	
Object ID:	69158
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1955.23
Primary Title:	Shadow Puppet (Wajang)- Man
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. Elizabeth Honecker
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:67.31 cm (h:26 1/2 inches)
Label Copy:	
Object ID:	69159
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Javanese

Accession Number:	1955.24
Primary Title:	Shadow Puppet (Wajang)- Man
Date:	c 1800s
Artist(s):	Indonesia (Java), 19th century
Credit Line:	Gift of Mrs. Elizabeth Honecker
Department:	Education Art
Collection:	Ed Art - Indian and South East Asian Art
Artists search link:	
Classification:	Leather
Medium:	leather, pigment
Copyright:	
Dimensions:	Overall - h:53.34 cm (h:21 inches)
Label Copy:	
Object ID:	69160
Object Type:	X
Period:	19th century
Inscription	
Inscription	

Indonesian

Accession Number:	1937.1183
Primary Title:	Shadow Figure
Date:	c 1875- 1925
Artist(s):	Indonesia, Late 19th- Early 20th century
Credit Line:	Gift of Robert M. Calfee
Department:	Education Art
Collection:	Ed Art - Chinese Art
Artists search link:	
Classification:	Miscellaneous
Medium:	leather, wood, pigment
Copyright:	
Dimensions:	Overall - h:53.34 cm (h:21 inches)
Label Copy:	
Object ID:	65996
Object Type:	D
Period:	Late 19th- Early 20th century
Inscription	
Inscription	

Dictionary

APPLICATION - act of using, use; refers to getting a technology that can be applied into society

ASTIGMATISM - defect in an eye or a lens that makes objects look indistinct or imperfect

BATTERY - a set of two or more electric cells which produce electric current

BICONCAVE - (of a lens) concave on both sides

BICONVEX - (of a lens) convex on both sides

BLIND - not able to see

BRAILLE - system of writing and printing for blind people

CATARACTS - a disease of the eye that makes a person partly or entirely blind if not corrected

CONCAVE - curving like the surface of a ball as seen from the inside

CONES - a solid body that narrows to a point from a round flat base. In the eyes, they help us to see color.

FARSIGHTED - seeing distant things more clearly than near ones

FILAMENT - a fine wire in a light bulb etc. giving off light when heated by a current

FOCAL DISTANCE - distance from its center to its principal focus

FOCAL LENGTH - distance between the center of a converging thin lens and an object

FOCAL POINT - the point of focus; a center of action or interest

FOCUS - the point or distance at which an object is most clearly seen by the eye or through a lens

FREQUENCY - the rate of the occurrence or repetition of something

ILLUSION - something that a person wrongly supposes to exist

IMAGE - a likeness or representation

INCANDESCENT - glowing with heat, shining

INCIDENT RAY - light that enters an object

KALEIDOSCOPE - a toy consisting of a tube containing small brightly colored fragments of glass etc. and mirrors that reflect light forming changing patterns

LASER - a device that generates an intense and highly concentrated beam of light; an acronym for: Light Amplification by simulated Emission of Radiation

LENGTH - linear measurement

LENS - a piece of glass or glasslike substance with one or both sides curved for use in optical instruments

LIGHT - of little weight; electromagnetic radiation traveling 186,300 miles per second; allowing visibility

LIGHT BULB - a round glass container enclosing a filament that is made to glow by electricity

MIRROR - a piece of glass backed with silver so that reflection takes place

OPTICAL ILLUSION - an involuntary mental misinterpretation of something seen, caused by its deceptive appearance

PRISM - a solid geometric shape with ends that are similar, equal and parallel

REFLECTED RAY - light that bounces off a surface

REFLECTION - bounces off a surface

REFRACT - bends light

REFRACTION - the bending of a ray of light, heat and sound at the boundary between two mediums of dissimilar nature

SCIENTIFIC METHOD - a systematic approach to gathering data and observation

WAVES - ridges of moving water along the surface of the sea

WAVE LENGTH - the distance between corresponding point in a sound wave or electromagnetic wave
(crest to crest)

Name _____ **Date:** _____ **Class** _____

Journal Reflection

What did you learn about light, shadows, and color while working on this unit?

What was the easiest portion of this unit? The most difficult?

Could you explain the science concepts to a friend? Why or why not?

After watching the class plays, what might you change about your own play?

Would you like to spend more time working with shadow puppets, less time, or was it just right?